

7392/435

FIG. 1

Plastic  
45  
2458/120

355  
345

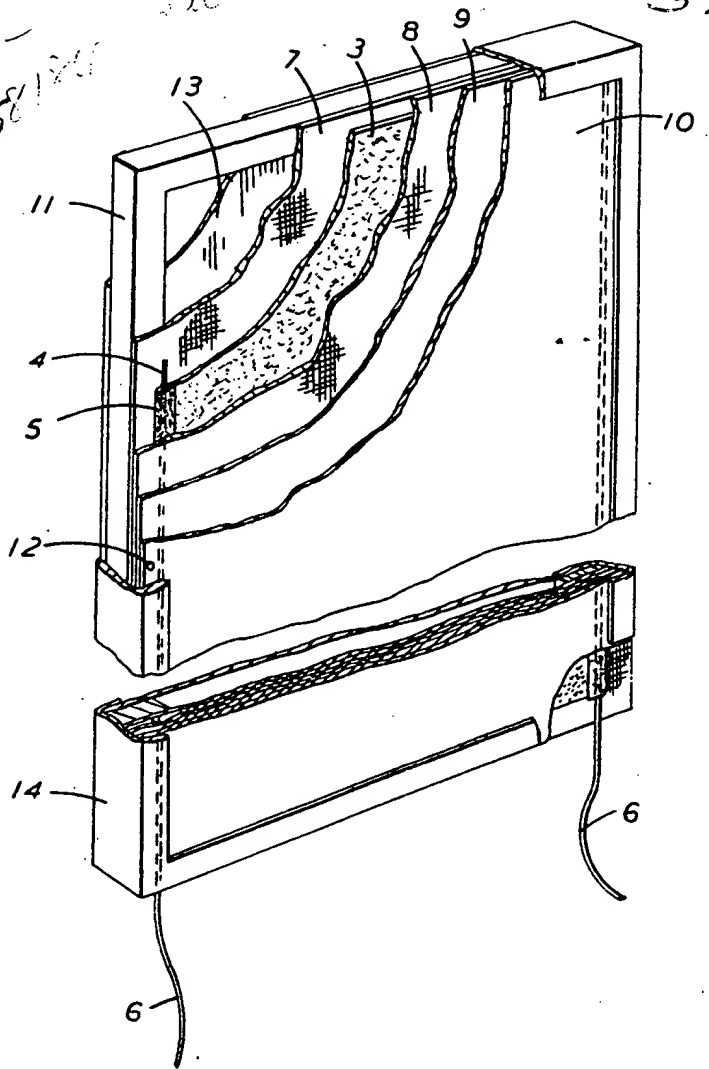
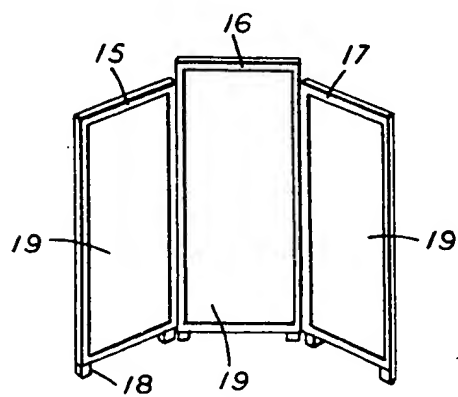


FIG. 2.



[This Drawing is a reproduction of the Original on a reduced scale.]

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# PATENT SPECIFICATION

586,886



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Complete Specification Accepted: April 3, 1947.

EXAMINER'S COPY

## COMPLETE SPECIFICATION

### Improvements in Electric Heating Panels

We, UNITED STATES RUBBER COMPANY, a Corporation organized and existing under the laws of the State of New Jersey, United States of America, at 1230, Sixth Avenue, New York, 20, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an electrically conducting panel, and more particularly to a laminated heating unit formed as a panel in which the heating element includes a flexible sheet having a plastic coating thereon containing electrically conducting carbon black in an amount sufficient to impart current conducting and heating properties to the sheet.

The heating unit according to the present invention comprises a sheet of flexible material having applied thereon a synthetic resin compound containing electrically conducting carbon black in amount sufficient to impart current conducting and heating properties to the sheet, electrical conductor wires secured along two edges of the sheet in parallel relation to each other, and a plurality of layers of protective material completely enclosing said sheet of flexible material and bonded therewith to form an integral panel. According to a further characteristic of this invention, the protective material enclosing said sheet of flexible material consists of a flexible insulating material coated with a film of synthetic resin.

The heating element is of smaller dimensions than the sheets applied thereto with the result that the heating unit is well insulated and completely enclosed within the laminæ. This allows the marginal portions of the panel to be tacked or otherwise fastened to a supporting member without danger of injury to the heating element. A heating unit as thus described may be used for various purposes. For example it may constitute the panel portion of a screen or it may be used to form the surface of a wall.

Among the advantages of our invention are to provide a heating panel compris-

ing a unitary composite structure; to provide such a panel having a surface which is abrasive resisting and easy to clean; to provide such a panel which may exhibit artistic decorative effects; to provide such a panel which may be easily fastened to a supporting structure; to provide such a panel which may be made to relatively large dimensions and still retain self-supporting and stiff characteristics; and, to provide such a panel which may be economically and efficiently manufactured. These and other objects and advantages will appear more fully in the following detailed description when considered in connection with the accompanying drawings in which:—

Figure 1 is a perspective view of a heating panel constructed in accordance with our invention and mounted on a supporting structure; and

Figure 2 is a perspective view of a folding screen illustrating a practical application for the heating panel.

With reference to the drawing and in particular to Figure 1, we show a heating panel comprising in part a heating element 3. The element 3 preferably is a woven fabric such as 4 oz. cotton sheeting and on one or both sides of the sheeting is applied an electrically conducting solution consisting of a thermo-plastic or thermo-setting synthetic resin containing electrically conducting carbon black. An example of such a conducting material is a plasticized cellulose acetate and acetylene carbon black. Good results are obtained by proportioning the materials by weight as follows:—

Cellulose Acetate	- - - - -	37.8%
Plasticizer	- - - - -	30.5%
Acetylene Black	- - - - -	31.7%

Any conventional plasticizer may be used with the cellulose acetate as for example methyl phthalyl ethyl glycolate. The compound may be thinned to proper consistency for application to the sheeting by thinning with a solvent such as ethyl acetate. This solution may be applied to the sheeting by painting, spraying or by a spreading operation.

Among the thermo-plastic or thermo-setting resins which may be compounded

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tion and in what manner the same is to be performed, we declare that what we claim is:—

1. A laminated heating unit comprising  
5 a sheet of flexible material having applied thereon a synthetic resin compound containing electrically conducting carbon black in amount sufficient to impart current conducting and heating properties  
10 to the sheet, electrical conductor wires secured along two edges of the sheet in parallel relation to each other, and a plurality of layers of protective material completely enclosing said sheet of flexible  
15 material and bonded therewith to form an integral panel.

2. A laminated heating unit according to Claim 1, wherein the protective material enclosing said sheet of flexible  
20 material consists of a flexible insulating material coated with a film of synthetic resin.

3. A laminated heating unit according to Claim 2, wherein prior to the bonding of the composite structure, a sheet of  
25 decorative material is applied to one surface thereof and the whole bonded together to form a stiff panel.

4. A laminated heating unit according to claim 3, wherein a sheet of transparent  
30 synthetic resin is adjacent to the decorative material and is likewise bonded into the composite structure.

5. A laminated heating unit according to any of the preceding claims, wherein the  
35 synthetic resin used is cellulose acetate.

6. A laminated heating unit according to claim 1, wherein the synthetic resin is plasticized cellulose acetate.

Dated this 24th day of October, 1944.

T. A. CLAYTON,  
For the Applicants.

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